ABSTRACT OF THE DISCLOSURE

A method for arithmetic expression optimization includes receiving an operator and at least one operand of a first instruction defined for a first processor having a first base. The method also includes converting the first instruction to a second instruction optimized for a second processor having a second base smaller than the first base when the at least one operand does not carry potential overflow beyond the second base or when the operator is insensitive to overflow. The method also includes converting instructions in an instruction chain to a wider base larger than the second base and smaller or equal to the first base when the at least one operand carries potential overflow beyond the second base and when the operator is sensitive to overflow. The chain is bounded by the second instruction and a third instruction that has been previously optimized and is the source of the potential overflow.